

GOVERNMENT OF INDIA
METEOROLOGICAL DEPARTMENT

INDIA WEATHER REVIEW, 1964

Annual Summary

PART B

SNOWFALL

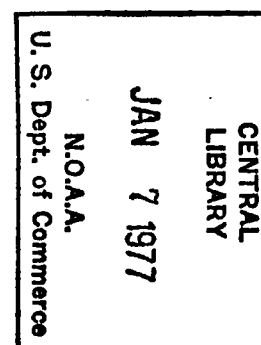
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INDIA WEATHER REVIEW 1964

ANNUAL SUMMARY PART - B

S N O W F A L L

This part contains a summary of the reports of snowfall in the mountain regions of north India based on (a) records of snowfall observations made at the observatories and (b) reports collected by local officers from the local residents, headmen of villages or from travellers who have passed through the region, and then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in metres or centimetres. At places provided with raingauges the snow, collected in the gauge, is melted and measured as rain. The heights of well-known peaks are reported in the nearest metre, wherever available, while the heights of mountain ranges etc. are reported in tens of metres. In the description, the figures given for depths for a month indicate the total amount of snowfall which occurred during that month.

Cold Weather/Winter Period - January and February

I - JAMMU AND KASHMIR

SRINAGAR DISTRICT

Srinagar (1585 m.) - Snowfalls were experienced in the valley on eleven days in January and on five days in February. They were more frequent on the adjoining peaks. The total precipitation recorded at the station was 9 cm. in January and 3 cm. in February. The standing crops were reported to have been damaged during the cold spell which prevailed in January. A thick layer of snow was visible on the surrounding peaks during both the months.

The snowfall was above normal in January and below normal in February.

LADAKH DISTRICT

Sonamarg (2515 m.) - January witnessed twenty seven days of snowfall and February sixteen days of which the largest spell was from the 14th to 22nd of the month. The total snowfall at the station in these months were 1.4 m. and 31 cm. respectively. The heaviest fall recorded during the period was 12 cm. on the 29th January. The amounts of snow accumulation on the passes were 6.4 m. in January and 6.7 m. in February. The accumulations on the peaks were estimated to be much more than those on the passes.

The snowfall was above normal in January and much below normal in February.

Leh (3514 m.) - In January, the station proper experienced snowfall on eleven days during the 4th to 24th of the month. In February, light snowfalls occurred from the 15th to 17th of the month. The total depths in these months were 29 cm. in January and 7 cm. in February. The snowfall accumulations on the high passes and peaks were estimated to be about 1.0 m. in January and 2.0 m. in February.

The snowfall was slightly above normal in both the months.

II - PUNJAB (I) AND HIMACHAL PRADESH

CHAMBA DISTRICT

Churah

Tissa (1570 m.) - The station received snowfall on the 9th, 20th, 22nd and 23rd January, the total depth being 34 cm. The heaviest fall of 18 cm. was recorded on the 23rd January. No snow fell during February.

The snowfall was normal in January and below normal in February.

Bhandal (1730 m.) - No snow fell at the station proper during the period.

Chamba

Chamba (924 m.) - There was no occurrence of snowfall at the station proper during January and February. The lowest heights to which the snowfalls descended in the region were about 1200 m. in January and about 2200 m. in February. The amounts of snow accumulation on some well-known passes in the region were as under :-

Name of Pass	Accumulation	
	January	February
Basodhan (2740m.)	1.2 m.	-
Sach (4420 m.)	3.7 m.	3.7 m.
Padhri (3660 m.)	1.2 m.	1.2 m.
Kalichho (5000 m.)	-	3.7 m.

The snowfall was about normal during the period.

Ludrera (924 m.) - No snowfall occurred at the station during the period.

Bhanota (914 m.) - No snowfall occurred at the station during the period.

Upper Chamba Range

Chhattrari (1793 m.) - The station proper experienced snowfall on three days in the first fortnight and in a spell of four days, viz. 20th to 23rd, in the second fortnight of January. The total depth of snowfall recorded was 72 cm. of which 30 cm. was recorded on the 22nd January. No snow fell during February. Snowfalls were experienced on the range at heights above 1200 m. in January and above 2200 m. in February. The depths of snowfall on the passes of Gaz Dhar varied from 30 cm. to 3.0 m. in January and 10 cm. to 2.5 m. in February. The amount of snow accumulation in the respective months on Gaz Dhar were about 2.7 m. and 2.3 m.

The snowfall was above normal in January and about normal in February.

Bhattiyat

Chowari (1021 m.) - No snow fell during the period.

Bathree (1372 m.) - No snow fell during the period

Bharmaur

Bharmaur (2155 m.) - The station experienced snowfall in three spells in

January, viz: 8th and 9th, 11th to 13th and 21st to 24th of the month. In February, snowfalls occurred on the 5th, 10th, 23rd and 24th of the month. The total depths in these months were 1.5 m. and 38 cm. respectively. The heaviest falls during the period were 36 cm. each on the 11th and 22nd January.

The snowfall was normal in January and below normal in February.

MAHASU DISTRICT

Chopal (2342 m.) - The station proper experienced snowfall on the 22nd and 23rd January. Snowfalls were again received on the 9th, 10th, 23rd and 24th February. The total depths in these months were 35 cm. and 34 cm. respectively at the station proper. The snow accumulations on Chur Dhar were 1.8 m. in January and 2.1 m. in February. The lower peaks such as Khirki, Mandha Ghati, Talra, Chhattar and Chhachpur received about 1.0 m. each in January. The amounts of snow accumulation were about 1.0 m. to 2.0 m. in January and about 2.0 m. in February.

The snowfall was below normal during the period.

Shilaroo (2591 m.) - The station received snowfall on seven days in each of the months. In January five of the falls were in the first half while in February there were only three during the first half. The respective depths in these months were 36 cm. and 56 cm. There was no accumulation of snow after each fall at the station.

The snowfall was below normal in both the months.

Phancha (Pandra Bis Range) (2271 m.) - The station proper experienced snowfall on seven days in January, in which five of the falls were in the first fortnight. In February, there were five days with snowfall, of which two days were in the second week and three days in the last week. The total depths in these months were 67 cm. and 51 cm. respectively. The maximum fall recorded in one day was 30 cm. on the 13th January. The amounts of snow accumulation were of the same order as the total depths in the respective months.

The snowfall was below normal in January and much below normal in February.

Junga (1989 m.) - There was no occurrence of snowfall during the period.

Rampur (1067 m.) - Snowfalls occurred on the 6th and 9th January and 10th and 23rd February. The snowfalls extended throughout the area of the tehsil at heights above 1500 m. The amounts of snow accumulation on Daran Ghati at the ends of January and February were about 75 cm. and 60 cm. respectively.

The snowfall was below normal in both months.

Kumarsain (1388 m.) - In January, there were six days of snowfall, of which one was in the first week, four in the second week and one in the last week of the month. In February, there were snowfalls on the 10th, 23rd and 24th of the month. The snowfalls descended up to heights of 2500 m. in both the months. The total depths of snowfall on Narkanda (2740 m.) as reported were about 30 cm. each in January and February. The same amount was estimated as the accumulation on Narkanda at the end of each month.

The snowfall was below normal during the period.

Theog (2286 m.) - Snowfall, accompanied by rain, occurred on the 22nd January and again on the 22nd and 23rd February. The amounts of snow accumulation on the peaks of Tir Mahasu and Kanagi were about 30 cm. each in January and about 45 cm. each in February.

The snowfall was below normal during the period.

Kotgarh (1829 m.) - The station proper and neighbourhood received snowfall on the 22nd January, 22nd and 24th February, the snowfall descending to heights of 1400 m. in February. The total depths of snowfall at the station proper were about 1 cm. in January and 25 cm. in February. The amount of snow accumulation on Hathu peak was estimated to be about 2.5 m. at the end of the period.

The snowfall was below normal in both the months.

Kotkhai (1676 m.) - The station proper did not experience any snowfall during the period. However, snowfall was observed on the adjoining peaks on the 6th, 7th, 9th to 13th and 22nd January while in February the snowfalls occurred on the 10th, 15th and 22nd to 24th of the month. The estimated total snowfall accumulations were about 1.5 m. each in January and about 50 cm. each in February on the peaks of Naira (2290 m.), Joshla (2440 m.), Mundroo (2440 m.), Khara Pathar (2590m.) and Bagi (2740 m.).

The snowfall was below normal during the period.

Suni (510 m.) - Snowfall was experienced in the sub-tehsil on the 5th and 21st January at heights above 1850 m. The depth of snowfall was about 30 cm. during the month. The region experienced snowfall again on three occasions in February, viz: 9th, 22nd and 23rd. The first fall was confined to heights above 1850 m. and the depth of snow was about 10 cm. In the next two falls lower regions of 1500 m. received snowfall, the total depth being about 30 cm. There was no accumulation of snow in January while at the end of February, the amount of snow accumulation on Shali peak (2740 m.) was about 15 cm.

The snowfall was below normal in January and normal in February.

Lower Pabar Range

(i) Bashla (2286 m.) - Snowfalls occurred in spells on the 5th to 12th and 21st and 22nd January and on the 9th and 10th and 22nd and 23rd February. The total depths in these months were 78 cm. and 30 cm. respectively. The heaviest fall during the period occurred on the 22nd January, the depth being 25 cm. at the station.

The snowfall was normal during the period.

(ii) Khadrala (2957 m.) - The station experienced snowfalls on eight days in January in which month there was a spell of five days from the 8th to 12th. In February, the snowfall occurred on seven days, most of which was in the first fortnight. The total depths were 2.3 m. in January and 1.9 m. in February. There were several heavy falls above 45 cm. during the period; the notable falls were 56 cm. on 22nd January and 58 cm. on 10th February.

The snowfall was above normal in January and much above normal in February.

Rohru (1524 m.) - There was no occurrence of snowfall at the station proper throughout the period, but areas in the tehsil above 1700 m. received snowfall in each of the months. The amount of snow accumulation on Chansal peak was about 1.5 m. in both the months.

The snowfall was below normal in both January and February.

Arki (1219 m.) - No snow fell during the period.

Solan (1530 m.) - No snow fell during the period.

Jubbal (1891 m.) - Snowfall occurred on the 6th, 13th and 22nd and 23rd January and on the 10th and 24th February. The total depths in these months were 30 cm. and 13 cm. respectively at the station proper. The total depths on Chambi Kupar peak and Khara Pathar pass were about 2.0 m. and 1.5 m. respectively in January and 1.0 m. and 75 cm. respectively in February. The same amounts as the total depths were reported as the accumulations at the ends of the months.

The snowfall was above normal in January and below normal in February.

Kasumpti (1989 m.) - There was no snowfall in January while a negligible amount of snowfall was reported during February.

The snowfall was below normal in both the months.

KINNAUR DISTRICT

Kilba-Kailash Range

(i) Kilba (1829 m.) - The station received snowfall on the 13th, 21st and 22nd January and on the 10th and 24th February. The total depths recorded were 18 cm. in January and 44 cm. in February.

The snowfall was below normal in January and above normal in February.

(ii) Sangla (2591 m.) - The station experienced snowfall in two spells in January, viz. 6th to 13th and 21st to 23rd. In February there were four days with snowfall in the first fortnight and an almost continuous spell of eight days from the 15th to 24th of the month. The total depths were 92 cm. in January and 1.2 m. in February. The heaviest fall during the period was 43 cm. on the 10th February.

The snowfall was slightly below normal in January and much above normal in February.

(iii) Purbani (2286 m.) - The station reported 53 cm. and 1.0 m. as the total depths in January and February respectively.

The snowfall was below normal in January and above normal in February.

Nichar (2286 m.) - Snowfalls occurred on the 6th, 13th, 21st and 22nd January and on the 10th, 23rd and 24th February. The total depths recorded in the respective months were 74 cm. and 84 cm. The heaviest fall during the period was 38 cm. on 21st January.

The snowfall was below normal in January and much above normal in February.

Kalpa - Snowfall was experienced at the station in both the months, the total depths reported being 72 cm. in January and 90 cm. in February.

The snowfall was about normal during January and above normal in February.

KULU DISTRICT

Banjar (Seraj tehsil) (640 m.) - The depths of snowfall and the amounts of snow accumulation at the ends of the months on the well-known peaks of the total tehsil were as under :-

Name of Peak	Depth of snowfall		Accumulation	
	January	February	January	February
Sakirn	1.7 m.	2.4 m.	1.5 m.	2.7 m.
Lambri	1.7 m.	2.4 m.	1.5 m.	2.4 m.
Shepakaru/Supa Kuni	3.7 m.	4.0 m.	3.7 m.	4.6 m.
Gargarasan	2.1 m.	2.7 m.	2.1 m.	3.0 m.
Bashelu	2.1 m.	3.0 m.	2.1 m.	3.4 m.
Pallach	1.2 m.	1.5 m.	1.2 m.	1.5 m.
Tirth (5623 m.)	3.7 m.	3.0 m.	4.0 m.	4.9 m.

The snowfall was normal in both the months.

Kulu (1218 m.) - Snowfall was experienced in both January and February at heights above 2000 m. Accumulation of snow was present on the well-known peaks of the tehsil during the period.

The snowfall was reported to be slightly above normal during the period.

MANDI DISTRICT

Mandi Sadar (762 m.) - Snowfall was experienced in the surrounding area during January, the total depth being about 15 cm. to 45 cm. No snow fell during February.

Karsoj - The tehsil experienced snowfall once during February only; the total depth reported was about 30 cm. on the 8th of the month.

Sundernagar - There was no occurrence of snowfall in the tehsil in both the months.

Sarkarghat - No snow fell in the tehsil in both the months.

SIRMUR DISTRICT - There were no snowfalls in the tehsils Nahan, Paonta and Renuka during both January and February. The highest regions of tehsil Pachhad received snowfalls in two spells during the period. The details are given below :-

Period	Depth of snowfall		
	1220 m. - 1830 m.	1830 m. - 2290 m.	2290 m. - 2740 m.
7th-8th January	5 cm. - 46 cm.	30 cm. - 76 cm.	61 cm. - 91 cm.
21st-22nd January	8 cm. - 61 cm.	46 cm. - 1.1 m.	76 cm. - 1.5 m.
Total depth	13 cm. - 1.1 m.	76 cm. - 1.9 m.	1.4 m. - 2.4 m.

The snowfall was reported to be below normal during the period.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - In January there was snowfall on the night of the 21st to the morning of the 22nd. The snowfall on the ridges over 2100 m. was about 5 cm. The peaks of Surkanda, Nagtiba and Taru-ka-Danda were covered with snow. The amounts of snow accumulation were about 5 cm. and above according to the heights of the peaks. No snowfall was experienced in February..

The snowfall was below normal during the period.

GARHWAL DISTRICT - No snow fell in the district during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation at the end of each month on some of the peaks of Malla Danpur were reported as under :-

Name of Peak	<u>Depth of snowfall</u>		<u>Accumulation</u>	
	January	February	January	February
Kautela	75 cm.	60 cm.	90 cm.	1.2 m.
Kafini	90 cm.	75 cm.	2.1 m.	2.4 m.
Bankatia	1.7 m.	1.2 m.	4.3 m.	4.6 m.
Pindar	2.0 m.	1.5 m.	5.2 m.	5.2 m.
Nanda Devi	2.3 m.	1.8 m.	5.5 m.	5.5 m.
Sundardhunga	1.7 m.	1.2 m.	4.9 m.	4.3 m.

The snowfall was about normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - Intermittent light snowfall occurred on the night of the 21st to the early morning of the 22nd January. The total depth recorded was about 1 cm. as some snow had melted. The snowfall was reported to have been experienced on all the surrounding high peaks such as Nainital, Gagrarh etc. No snow fell in February.

The snowfall was below normal during the period.

Hot Weather/Pre-Monsoon Period - March to May.

I - JAMMU AND KASHMIRNORTH BARAMULLAH DISTRICT

Gulmarg (2652 m.) - The reports for March and April were not received. The region experienced snowfall during May. The amount of snow accumulation on the Apharwat and Handibal mountains was normal.

SRINAGAR DISTRICT

Srinagar (1585 m.) - No snowfall occurred at the station proper or in the valley throughout the period, but all the surrounding peaks and passes experienced snowfall. In March light to moderate snowfalls were observed on ten days, half of which were in the first fortnight. There were several snowfalls in April while there were only two in May. These last two falls were light and confined to the higher passes and peaks. At the end of March all the peaks and passes such as Apharwat, Zojila and Pir Panjal were

thickly covered with snow, but towards the end of the period only a thin layer of snow was visible on Apharwat and Zojila peaks.

The snowfall was normal during the period.

UDHAMPUR DISTRICT

Patnitop (Batote) (2033 m.) - The reports for March and April were not received. Snowfall was observed on the 23rd and 25th May on the highpeaks of Banihal Range, Bhadarwah and Kishtwar mountains. Ranasar, eleven miles to the northwest of the observatory, experienced snowfall, accompanied by rain on the 23rd May.

LADAKH DISTRICT

Sonamarg (2515 m.) - The station experienced snowfalls in two spells in March, viz. 16th to 18th and 23rd & 24th. The total depths in the spells were 23 cm. and 20 cm. respectively. In April snowfall occurred on the 15th and 16th of the month, the total depth being 8 cm. No snow fell during May.

The snowfall was below normal during the period.

Dras (3066 m.) - The reports for March and April were not received. No snow fell during May.

Leh (3514 m.) - Light snowfalls occurred at the station on the 18th March but heavier falls were reported to have occurred at heights of 5500 m. to 6000 m. The total depths at these heights were estimated to be as much as 1.8 m., resulting in the closure of the passes. In April, the station received light snowfalls on the 3rd, 12th, 17th and 26th of the month. On the 12th April regions of 4000 m. to 5500 m. also received snowfall, the depth being 5 cm. Snowfalls occurred on the 4th, 8th, 22nd and 29th May at the station, but much more frequently on the high passes and peaks. The amount of snow accumulation on the passes and peaks remained at about 2.0 m. throughout the period.

The snowfall was normal during the period.

II - PUNJAB (I) AND HIMACHAL PRADESH

CHAMBA DISTRICT

Churah

Tissa (1570 m.) - No snowfall occurred during the period.

Bhandal (1730 m.) - No snow fell during the period.

Chamba

Chamba (924 m.) - The station proper did not receive any snowfall during the period. The surrounding regions experienced snowfall at heights above 2150 m. in March and above 2450 m. in April and May. The amounts of snow accumulation at the end of each month on some well-known passes of the district were reported as under :-

Name of Pass	Accumulation		
	March	April	May.
Sach (4410 m.)	3.0 m.	3.7 m.	2.4 m.
Chehni (4570 m.)	3.7 m.	*	2.7 m.
Marali (2740 m.)	30 cm.	*	*
Padhri (3660 m.)	*	1.2 m.	*
Kalichho (5000 m.)	*	3.7 m.	*

* Report not received.

The snowfall was normal during the period.

Ludrera (924 m.) - No snow fell during the period.

Bhanota (914 m.) - No snow fell during the period.

Upper Chamba Range

Chhattrari (1793 m.) - There was no occurrence of snowfall at the station proper during the period. In March, snowfall varying from 10 cm. to 15 cm. in depth occurred on the passes of Gaz Dhar at elevations above 2150 m. In April, heights above 3050 m. received snowfall, the depths varying from 10 cm. to 15 cm. Snowfalls and snow storms were reported on the 13th, 15th, 21st and 22nd May. These occurred on the higher passes above 3000 m. The total depths of snow were estimated to be about 30 cm. each on the passes of Baliani, Bohar, Kali Nali and Gaz Dhar. The amount of snow accumulation on the passes was about 2.0 m. at the end of March and decreased to about 1.0 m. towards the end of the period.

The snowfall was reported to be above normal during the period.

Bhattiyat - No snowfall occurred at the stations Chowari (1021 m.) and Bathree (1372 m.) during the period.

Bharmaur

Bharmaur (2155 m.) - The station proper received snowfall on the 4th and 19th March and again on the 17th April; the total depths in these months were 8 cm. and 5 cm. respectively. In May, snowfalls occurred on the surrounding regions at heights above 2450 m.

The snowfall was below normal during the period.

MAHASU DISTRICT

Chopal (2342 m.) - No snow fell during the period.

Shilaroo (2591 m.) - The station experienced snowfall on the 19th March, the depth being 4 cm. No snow fell during April and May.

The snowfall was below normal in March.

Junga (1989 m.) - There was no occurrence of snowfall during the period.

Rampur (1067 m.) - No snow fell during the period.

Kumarsain (1388 m.) - The tehsil experienced snowfall at elevations above 2400 m. on the 19th and 20th March. The depth of snowfall on Narkanda peak was about 8 cm. The same amount was reported as the accumulation at the end of March. No snow fell during April and May.

The snowfall was below normal in March.

Theog (2286 m.) - There was no snowfall during the period.

Kotkhai (1676 m.) - Snowfall occurred on the high peaks of the tehsil on the 20th March. The depth of snowfall was about 10 cm. on the peaks such as Khara Pathar, Joshla, Mundroo, Bagi and Naira. The snowfall did not accumulate. No snow fell during April. The report for May was not received.

The snowfall was below normal in March and normal in April.

Suni (510 m.) - There was no occurrence of snowfall during the period.

Lower Pabar Range

(i) Bashla (2286 m.) - The station proper received snowfalls on six days in the second half of March, the total depth amounting to 42 cm. The heaviest fall of 21 cm. was recorded on the 19th March. The reports for April and May were not received.

The snowfall was much above normal in March.

(ii) Khadrala (2957 m.) - The station proper experienced snowfall on seven days during the second half of March. The total depth recorded was 44 cm. of which 25 cm. fell on the 19th March. The reports for April and May were not received.

The snowfall was below normal in March.

Rohru (1524 m.) - No snowfalls were experienced at the station proper throughout the period, but snowfalls were reported to have occurred at heights above 1700 m. in March. The amount of snow accumulation on Chansal peak was about 1.5 m. towards the end of the month.

The snowfall was normal during the period.

Arki (1219 m.) - There was no occurrence of snowfall in the tehsil during the period.

Solan (1530 m.) - No snowfall occurred in the tehsil throughout the period.

Jubbal (1891 m.) - The tehsil received snowfall on the 20th March. The depths of snow reported were 3 cm. at the station proper, 25 cm. on Khara Pathar pass and 45 cm. on the highest peak Chambi Kupar.

The snowfall was below normal in March.

Kasumpti (1989 m.) - No snow fell during the period.

KINNAUR DISTRICT

Kilba-Kailash Range

(i) Kilba (1829 m.) - There was only one snowfall on the 20th March during the period, the depth being about 1 cm.

The snowfall was below normal during the period.

(ii) Sangla (2591 m.) - In March, the station received snowfalls on the 3rd, 4th, 19th and 20th of the month, the total depth being 52 cm. No snow fell in April. Snowfalls were again received on the 23rd and 24th May, the depth being 17 cm.

The snowfall was below normal in March and April, but above normal in May.

(iii) Purbani (2286 m.) - The station reported the occurrence of snowfall in March, the total depth being 5 cm. The reports for April and May were not received.

The snowfall was below normal in March.

Nichar (2286 m.) - No snowfall was reported during the period.

Kalpa - The station experienced snowfall throughout the period. The total depths were 80 cm. in March, 4 cm. in April and 14 cm. in May.

KULU DISTRICT

Banjar (Seraj tehsil) (640 m.) - The depths of snowfall and the amounts of snow accumulation at the end of March on the peaks of the tehsil were reported as under :-

Name of Peak	Depth of snowfall	Accumulation
Sakirn	1.8 m.	2.1 m.
Lambri	1.5 m.	1.8 m.
Shepakaru/Supa Kuni	2.1 m.	3.7 m.
Gargarasan	1.8 m.	2.4 m.
Bashelu	1.8 m.	2.7 m.
Pallach	60 cm.	90 cm.
Tirth	2.1 m.	3.7 m.

Detailed reports for April and May were not received.

The snowfall was above normal in March.

Kulu (1218 m.) - Snowfall was experienced in the tehsil throughout the period. In March and April, the snowfalls descended to 2100 m. while in May the snowfalls were confined to the high peaks above 3000 m. The depths of snowfall and the amounts of snow accumulation at the end of May were as under :-

Name of Peak	Depth of snowfall	Accumulation
Hampta	75 cm.	1.1 m.
Rohtang	90 cm.	1.4 m.
Barshai	45 cm.	60 cm.
Bhog Dhar	45 cm.	45 cm.
Chander Khani	40 cm.	50 cm.
Lohari Acchri	30 cm.	30 cm.
Sari	45 cm.	60 cm.
Mughag	15 cm.	15 cm.
Bhuboo	30 cm.	45 cm.
Bastari	40 cm.	40 cm.

The snowfall was reported to be below normal during May.

MANDI DISTRICT - There were no snowfalls in the district during the periods as reported by the various local authorities. The amount of snow accumulation on Nargu peak was about 60 cm. towards the end of May.

SIRMUR DISTRICT -

No snowfalls were reported throughout the period in the tehsils Nahan, Paonta, Renuka and Pachhad.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfall occurred during the period.

GARHWAL DISTRICT - No snow fell during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation on the well-known peaks of Malla Danpur at the end of each month were reported as under :-

Name of Peak	March	April	May
<u>SNOWFALL</u>			
Kautela	30 cm.	0	15 cm.
Kafini	60 cm.	30 cm.	30 cm.
Bankatia	1.2 m.	90 cm.	90 cm.
Pindar	1.5 m.	60 cm.	60 cm.
Nanda Devi	2.1 m.	1.5 m.	1.2 m.
Sundardhunga	2.4 m.	60 cm.	60 cm.
<u>ACCUMULATION</u>			
Kautela	1.2 m.	60 cm.	30 cm.
Kafini	2.1 m.	90 cm.	1.2 m.
Bankatia	4.0 m.	3.0 m.	4.6 m.
Pindar	3.7 m.	1.8 m.	3.0 m.
Nanda Devi	4.6 m.	3.7 m.	5.5 m.
Sundardhunga	4.3 m.	1.2 m.	1.5 m.

The snowfall was above normal in March and below normal in April and May.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snow fell during the period.

Southwest Monsoon Period - June to September

June - July

I - JAMMU AND KASHMIR

NORTH BARAMULLAH DISTRICT

Gulmarg (2652 m.) - Five snowfalls were observed on the Apharwat and Handibal mountains on the 2nd, 4th and 5th, 14th and 16th June. The same regions experienced light snowfalls on the 15th and 17th July. Accumulation of snow was visible on the surrounding mountains and passes during both the months.

The snowfall was reported to be above normal during the period.

SRINAGAR DISTRICT

Srinagar (1585 m.) - There were no snowfalls in the region during June and July. The thin layer of snow accumulation, which was present on the surrounding peaks in June, melted by the end of July.

The snowfall was below normal in June and normal in July.

LADAKH DISTRICT

Sonamarg (2515 m.) - No snowfall occurred during the period.

Leh (3514 m.) - No snow fell during the period. Accumulation of snow was present on the well-known higher passes at the end of June only, the amount being about 1.5 m.

The snowfall was below normal during the period.

II - PUNJAB (I) AND HIMACHAL PRADESH

CHAMBA DISTRICT

Pangi

Kilar (Pangi Range) (2564 m.) - The report for June was not received. In July one light snowfall occurred in the valley while heavier snowfall was experienced on the peaks. The amounts of snow accumulation at the end of July on some well-known passes were about 3.7 m. to 4.6 m. on Sach pass, 3.0 m. to 4.0 m. on Drati pass and 2.4 m. to 3.4 m. on Chehni pass. The accumulation of snow was stated to be above normal.

Upper Chamba Range

Chhattrari (1793 m.) - Snowfalls were experienced on the 2nd, 13th, 21st, 28th and 29th June at heights ranging from 2500 m. to 4000 m. The total depth of snow was about 23 cm. on the passes of Baliani, Bohar, Kali Nali and Gaz Dhar. In July, snowfalls were reported on the 5th, 11th, and 18th but these falls were confined to the highest peaks of the range. The total depth was about 8 cm. The amounts of snow accumulation was about 1.0 m. on Gaz Dhar, Baliani pass and Bohar pass at the end of June and about 30 cm. on Belaz Dhar and Baliani pass at the end of July. The amount of snow accumulation on Kanikote peak was about 60 cm. at the end of the period.

The snowfall was reported to be above normal in June and below normal in July.

MAHASU DISTRICT - No snowfalls were experienced at the stations Chopal (2342 m.), Shilaroo (2591 m.), Junga (1989 m.), Rampur (1067 m.), Kumarsain (1388 m.), Theog (2286 m.), Suni (510 m.), Rohru (1524 m.), Arki (1219 m.), Solan (1530 m.) and Kasumpti (1989 m.) during the period June and July.

KINNAUR DISTRICT - No snowfalls were reported during the period by the stations in the Kilba-Kailash Range and by the stations Nichar (2286 m.) and Kalpa.

MANDI DISTRICT - There was no occurrence of snowfall in the district in both June and July.

SIRMUR DISTRICT - No snowfall occurred in the district throughout the period.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfalls were experienced during the period.

GARHWAL DISTRICT - No snowfalls were experienced during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of accumulation at the end of each month on the well-known peaks of Malla Danpur were reported as under :-

Name of Peak	Depth of Snowfall		Accumulation	
	June	July	June	July
Kautela	0	0	15 cm.	0
Kafini	15 cm.	0	60 cm.	0
Bankatia	30 cm.	15 cm.	1.5 m.	1.5 m.
Pindar	30 cm.	15 cm.	1.8 m.	1.8 m.
Nanda Devi	60 cm.	45 cm.	2.4 m.	2.4 m.
Sundardhunga	30 cm.	30 cm.	1.5 m.	1.5 m.

The snowfall was normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snow fell during the period.

August - September

I - JAMMU AND KASHMIRNORTH BARAMULLAH DISTRICT

Gulmarg (2652 m.) - No snowfalls were observed during August. The Handibal and Apharwat mountains experienced snowfall on the 23rd, 26th and 27th September. Snow accumulation was present on these mountains but was noticeably less in August.

The snowfall was below normal in August and normal in September.

SRINAGAR DISTRICT

Srinagar (1585 m.) - No snowfalls occurred in August at the station and on the surrounding peaks and passes. In September light to moderate snowfalls were observed on all the surrounding mountains on the 26th of the month. Accumulation of snow was present on the surrounding peaks at the end of September only.

The snowfall was below normal in both August and September.

UDHAMPUR DISTRICT

Patnitop (Batote) (2033 m.) - During the period under report only one snowfall was observed on the high peaks of Bhadarwah and Sansar on the 25th August.

LADAKH DISTRICT

Sonamarg (2515 m.) - No snowfall was reported during the period.

Leh (3514 m.) - There was no snowfall during August. Snowfall was observed on the 25th-26th September at heights of 4500 m., the depths being about 5 cm. Information pertaining to snow accumulation was not reported.

The snowfall was normal during the period.

II - PUNJAB (I) AND HIMACHAL PRADESH

CHAMBA DISTRICT

Upper Chamba Range

Chhattrari (1793 m.) - Snowfall was observed on the highest peaks of the range on the 9th and 17th August and again on the 1st, 25th and 26th September. The respective depths in these months were estimated to be about 8 cm. & 15 cm. The amounts of snow accumulation on some well-known locations were as under :-

Name of Location	Accumulation	
	August	September
Baliani Pass	30 cm.	15 cm.
Kanikote Pass	50 cm.	30 cm.
Belaz Dhar	25 cm.	-
Sabrew	-	15 cm.

The snowfall was normal during the period.

MAHASU DISTRICT - During the period no snowfalls were experienced at the stations Chopal (2342 m.), Shilaroo (2591 m.), Junga (1989 m.), Rampur (1067 m.), Kumarsain (1388 m.), Theog (2286 m.), Suni (1219 m.), Rohru (1524 m.), Arki (1219 m.), Solan (1530 m.) and Kasumpti (1989 m.).

KINNAUR DISTRICT - No snowfalls were reported during the period by the stations Kilba (1829 m.), Sangla (2591 m.), in Kilba-Kailash Range, Nichar (2286 m.) and Kalpa.

MANDI DISTRICT - No snow fell during the period.

SIRMUR DISTRICT - No snowfalls were experienced in the district during the period.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfalls were experienced in the district in both the months.

GARHWAL DISTRICT - There were no snowfalls in the district in both the months.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation on the high peaks of Malla Danpur were reported as under :-

Name of Peak	Depth of Snowfall		Accumulation	
	August	September	August	September
Kautela	0	0	0	0
Kafini	0	0	0	0
Bankatia	15 cm.	25 cm.	1.5 m.	1.5 m.
Pindar	30 cm.	30 cm.	1.8 m.	1.8 m.
Nanda Devi	45 cm.	60 cm.	2.4 m.	2.4 m.
Sundardhunga	15 cm.	15 cm.	1.2 m.	1.2 m.

The snowfall was normal in August and below normal in September.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snow fell during the period.

Post Monsoon Period - October to December

I - JAMMU AND KASHMIR

SRINAGAR DISTRICT

Srinagar (1585 m.) - No snowfalls were observed in the valley as well as on the surrounding mountains during October. One snowfall was observed on the 30th November on the adjoining peaks and passes. In December two heavy falls were experienced at the station proper on the 10th and 11th of the month. The falls were reported to have been much heavier on the surrounding peaks and passes. The total precipitation recorded at the station proper was 15 cm. in December. There was accumulation of snow on all the surrounding peaks and passes and also in the valley at the end of December.

The snowfall was below normal during the period.

UDHAMPUR DISTRICT

Patnitop (Batote) (2033 m.) - There was no occurrence of snowfall in October and November. Snowfalls were experienced in December in two spells viz: 10th to 12th and 18th to 31st.

LADAKH DISTRICT

Sonamarg (2515 m.) - No snow fell in October. There were two occurrences of snowfall in November on the 20th-21st and on the 27th-28th, the total depth of snow being about 30 cm. In December, the station experienced three spells of snowfall, the first from 9th to 11th, the second from 17th to 19th and the third on 28th-29th. The total depth was about 60 cm.

The snowfall was below normal during the period.

Leh (3514 m.) - Only one light snowfall was experienced throughout the period on the 23rd December. The depth of snowfall at the station proper was negligible while that at heights of 4500 m. to 6100 m. was about 5 cm.

The snowfall was below normal during the period.

II - PUNJAB (I) AND HIMACHAL PRADESHCHAMBA DISTRICTUpper Chamba Range

Chhattrari (1793 m.) - There was no snowfall nor any accumulation of snow during October. The higher regions of the range experienced snowfall on the 19th November and again on the 9th to 12th December. The depths of snowfall on the peaks of Kanikote, Sabrew and Baliani were about 30 cm. each in November and about 90 cm. each in December. The amounts of snow accumulation at the ends of November and December were reported as under :-

Name of Pass	<u>Accumulation</u>	
	November	December
Baliani	30 cm.	1.8 m.
Kanikote	25 cm.	2.0 m.
Sabrew	30 cm.	2.0 m.

The snowfall was below normal during the period.

MAHASU DISTRICT

Chopal (2342 m.) - No snowfall occurred during October and November. Snowfall was experienced in December, the total depth being about 15 cm.

The snowfall was below normal during December.

Shilaroo (2591 m.) - There was no occurrence of snowfall during October and November. In December there was a spell of snowfall from the 11th to 13th of the month. The total depth of snow recorded was 12 cm.

The snowfall was below normal during December.

Junga (1989 m.) - No snow fell during the period.

Rampur (1067 m.) - There were no snowfalls during October and November. The tehsil experienced snowfalls on the 10th and 12th December at elevations above 1500 m. The amount of snow accumulation on the high peaks, such as Daran Ghati, was about 45 cm. at the end of the period.

The snowfall was below normal during December.

Kumarsain (1388 m.) - The reports for October and November were not received. Snowfalls occurred on the 8th and 13th December at elevations above 1500 m. The depth of snowfall at Narkanda (2740 m.) was about 60 cm. The amounts of snow accumulation at the end of December were about 10 cm. at elevations of 1500 m. and about 60 cm. to 90 cm. at the higher elevations of 2700 m. and above.

The snowfall was below normal in December.

Theog (2286 m.) - The reports for October and November were not received. The station proper received snowfall on the 10th and 11th December, the depth being 8 cm. The amounts of snow accumulation at the end of the period on Tir Mahasu and Kanagi were about 30 cm. each.

The snowfall was below normal in December.

Kotgarh (1829 m.) - The reports for October and November were not received. The station proper experienced snowfall on the 12th and 13th December, the depth being about 15 cm. There was no accumulation of snow on the passes.

The snowfall was below normal in December.

Kotkhai (1676 m.) - The reports for October and November were not received. The peaks in the region experienced snowfall on the 10th to 13th of December. The depth of snowfall was about 4 cm. each on the surrounding peaks such as Naira, Joshla, Mundroo, Bagi and Khara Pathar.

The snowfall was below normal in December.

Suni (510 m.) - The reports for October and November were not received. The tehsil experienced snowfall on the 11th December, the depth amounting to 20 cm. The snowfall descended to heights of 1200 m. There was no accumulation of snow at the end of the month.

The snowfall was below normal in December.

Lower Pabar Range

(i) Bashla (2286 m.) - The reports for October and November were not received. The station received snowfall on the 9th to 12th December, the total depth amounting to 53 cm. The heaviest fall recorded was 25 cm. on the 11th December.

The snowfall was above normal in December.

(ii) Khadrala (2957 m.) - The reports for October and November were not received. The station proper experienced snowfall from the 9th to 12th December. The total depth recorded was 75 cm. of which 38 cm. fell on the 11th of the month.

The snowfall was above normal in December.

Rohru (1524 m.) - The station proper did not receive any snowfall throughout the period, but regions above station height experienced snowfall on the 11th and 12th December. The amount of snow accumulation on Chansal peak was about 45 cm. at the end of the month.

The snowfall was below normal during the period.

Arki (1219 m.) - No snow fell during the period.

Solan (1530 m.) - No snow fell during the period.

Jubbal (1891 m.) - The reports for October and November were not received. There was none snowfall on the 12th December. The depths of snow were 10 cm. at the station proper, 45 cm. to 75 cm. at Khara Pathar and about 60 cm. to 90 cm. on the highest peak Chambi Kupar. The same amounts as the depths were reported as the accumulations at the end of the period.

The snowfall was below normal in December.

Kasumpti (1989 m.) - No snow fell during the period.

Mashobra (2270 m.) - The reports for October and November were not received. The station received snowfalls on the 11th to 13th December, the total depth being about 11 cm. The same amount was reported as the accumulation at the end of the month.

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The snowfall was stated/have been below normal in December.

KINNAUR DISTRICTKilba-Kailash Range

(i) Kilba (1829 m.) - There was only one very light snowfall on the 13th December during the period.

The snowfall was below normal during the period.

(ii) Sangla (2591 m.) - No snow fell in October and November. The station received light snowfalls from the 11th to 13th December. The depth of snow was less than 1 cm.

The snowfall was below normal during the period.

Nichar (2286 m.) - No snowfalls occurred during October and November. Snowfalls were experienced in December, the total depth amounting to 15 cm.

The snowfall was below normal during the period.

Kalpa - No snow fell during the period.

MANDI DISTRICT

Mandi Sadar - There was no occurrence of snowfall during October and November. The tehsil experienced snowfall in December. The total depth varied from 15 cm. to 25 cm.

The snowfall was below normal during the period.

Karsoj - The tehsil experienced snowfall only in December. The total depth of snowfall reported was about 30 cm.

Sundarnagar - No snowfall occurred in the tehsil during the period.

Sarkarghat - No snowfall occurred in the tehsil during the period.

SIRMUR DISTRICT - No snowfalls were reported by the tehsils Nahan, Paonta, Renuka and Pachhad during the period.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - There were no snowfalls during October and November. In December snowfalls occurred during the nights of the 10th and 11th of the month. The depth of snowfall on the ridges above 1700 m. was about 1 cm. and above according to the heights. The peaks of Surkanda, Nagtiba and Taru-ka-Danda in Dhanolti Peshkari were covered with snow.

The snowfall was below normal during the period.

GARHWAL DISTRICT - No snowfall was recorded in the district during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation on some peaks of Malla Danpur were reported as under :-

Name of Peak	October	November	December
<u>SNOWFALL</u>			
Kautela	0	45 cm.	0
Kafini	15 cm.	60 cm.	25 cm.
Bankatia	45 cm.	75 cm.	50 cm.
Pindar	60 cm.	90 cm.	75 cm.
Nanda Devi	75 cm.	1.2 m.	1.2 m.
Sundardhunga	30 cm.	90 cm.	50 cm.
<u>ACCUMULATION</u>			
Kautela	0	0	0
Kafini	0	15 cm.	15 cm.
Bankatia	1.8 m.	1.8 m.	2.1 m.
Pindar	2.1 m.	2.1 m.	2.4 m.
Nanda Devi	2.4 m.	2.4 m.	2.7 m.
Sundardhunga	1.5 m.	1.5 m.	2.0 m.

The snowfall was below normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snowfall occurred during October and November. Light to moderate snowfalls occurred on the 9th and 10th December. The total depth recorded was about 5 cm. only as most of the snow had melted. The snowfalls extended to all the adjoining high peaks such as Nainital, Ramgarh, Gagarh etc.

The snowfall was normal in December.

S U M M A R Y

Winter Period - January and February

Snowfall during the period was slightly above normal in Jammu and Kashmir but slightly below normal in Punjab (I), Himachal Pradesh and Uttar Pradesh.

Pre-Monsoon Period - March to May

Snowfall during the period was slightly below normal in Jammu and Kashmir, Punjab (I), Himachal Pradesh and Uttar Pradesh.

Monsoon Period - June and July

As usual, practically no snow fell in Jammu and Kashmir, Punjab (I) and Himachal Pradesh. The snowfall was normal in Uttar Pradesh.

Monsoon Period - August and September

The snowfalls were confined to the higher peaks and ranges. The snowfall was slightly below normal in Jammu and Kashmir as well as in Uttar Pradesh.

Post Monsoon period - October to December

Snowfall during the period was below normal in Jammu and Kashmir, Punjab (I), Himachal Pradesh and Uttar Pradesh.

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N. B. :- It is not possible to adopt a single classification of seasons which will be satisfactory for the whole of India. The classification adopted in this publication, is devised from the point of view of rainfall in the country.

SG./Rotaprint, Poona.